

Dairy Based Cosmetic Product and Process for Making

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This is a continuation-in-part of application Ser. No. 09/156,444,
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Field of the invention

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The present invention relates to a dairy-based cosmetic products
which are based on a high whey content, and to processes for making.

Background

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Cheese is prepared from milk that has been clotted, such as by the
addition of an acid, inoculum, or rennet to form a curd. Whey (*Serum lactis*) is a
cloudy liquid, the watery part of milk and is separated from the curd in the process
of making cheese by centrifugation, decanting, or filtration. The most important
ingredients of whey include lactose (and slight amounts of glucose and galactose),
protein (albumin, and globulin), vitamin B (mainly riboflavin), and minerals and
trace elements. Whey also has a milk-fat (triglyceride) content which can be either
removed by centrifugation, or incorporated by homogenization. Whey is used as a
valuable food supplement, but its shelf life is relatively short, therefore it has to be

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refridgerated and it has to be consumed rather quickly. Two major types of whey are available as protein sources, acid whey with a pH of <5.1 which is obtained from cottage cheese manufacture, and sweet whey with a pH of >5.6 , resulting from the rennet-coagulated cheese manufacture. The composition of both of these whey varieties is slightly different, and variable, both of these varieties contain from about 0.7% to about 0.8% protein on a liquid basis, with whey proteins representing from about 10% to about 12% of the total whey solids.

Small quantities of condensed, deproteinated whey are used for making milk vinegar by fermentation with lactonitril. In the '50s there was a suggestion that the high vitamin content of whey would make it a suitable cosmetic ingredient, but in spite of that and its high nutritional value, liquid whey is generally considered to be a waste product and is mainly discredited due to its unattractive appearance, undesirable flavor and poor shelf life. Some cosmetic products have been made with small concentrations (max, up to about 20%) of liquid whey, but their shelf was unsatisfactory at higher whey solids concentrations.

Dry whey is a processed, usually freeze dried or spray dried powder

which corresponds to about 15.4 times the weight of liquid whey. Some forms of whey powder are processed into concentrated protein isolates also being known under various trade names such as lactoferrin. These dry whey concentrates are generally used as an antimicrobial protein and an immuno-modulator, and usually contain over 25% protein. When the non-proteinaceous, low molecular weight constituents such as lactose, minerals, non-protein nitrogen and vitamins are removed, usually by physical separation (e.g. ultrafiltration, precipitation or dialysis), whey protein concentrates of over 90% protein can be obtained in the retentate. The high-protein concentrates are usually employed after pH adjustment in producing lactose, alcohol, single-cell protein, yeast, galactose, glucose, cattle feed and various pharmaceuticals. Except for the reduced moisture content, unprocessed dry whey usually retains the same constituents in the same proportion as in the fresh sweet or fresh acid whey from which it is dehydrated.

There have been proposed cosmetic products with a relatively low whey content, but they did not become commercially viable due to their limited shelf life mainly, because even with a low whey content their shelf life could not be extended by the use of conventional preservatives.

Summary of the present invention

It is an object of the present invention to provide processes for the utilization of whey byproducts by appropriate preservative treatment for enabling its use in cosmetic formulations, utilizing its high vitamin and protein values and to improve its shelf life.

As used throughout the specification and the claims "whey" is suitably generally sweet dry whey powder or sometimes even sweet liquid whey, optionally pH adjusted to a desired maximum value.

The cosmetic product of the present invention is especially characterized by an unprecedentedly high whey content in excess of 3% wt. solids basis (corresponding to about 45% fresh liquid whey), and contains a preservative. Except when a bath powder is made, suitably a liquid premix is prepared which can be used during its shelf life as a basic ingredient further by adding thereto EDTA and citric acid and to formulating a cosmetic product therefrom in a manner known *per se* to cosmetic formulators.

Detailed disclosure

The fresh, natural sweet whey from cheese manufacture is defatted, usually by centrifugation and, it is one advantage of the present invention that it does not require any homogenization. During centrifugal defatting any casein particles are also removed from the liquid. The minimal residual fat content is beneficially used to bring fat soluble vitamins into solution. The resulting fresh, defatted whey also includes lactose, protein (albumin and globulin) vitamins (A, B1, B2, B6, B12, pantothenic acid, C, biotin) and mineral traces (Ca, Mg, Na, K, P, Cl).

Cosmetic products of all varieties can be prepared in accordance with the process of the present invention. The common feature of all of these cosmetic products is that, with the exception of a bath powder, they are made by the use a whey-based premix, containing a very high percentage of whey. The premix made by the process of the present invention can be stored under refrigeration for extended periods of time, generally up to a month.

In preparing the premix suitably dry whey powder is used. This is simply produced by the drying of fresh, natural whey, such as by spray drying.

The dry whey powder residue is about 6.5% wt. of the starting liquid whey. The premix is made by mixing the powder with a liquid carrier, such as water, suitably deionized or distilled water, or even liquid whey. The mixture is heated, suitably to a temperature between about 50°C and below its boiling point, suitably for a period of from about 20 minutes to about an hour. The heating can be suitably carried out at slightly reduced pressure, in one or more stages. The heated mixture is subsequently cooled (or allowed to cool) to ambient temperature. Any reference to “cooling” is intended to cover both cooling with the aid of external cooling means, and merely allowing to cool to ambient by exposure to the ambient.

An essential ingredient of the premix is a preservative, suitably an antimicrobial paraben preservative such as those sold under the trade names Phenova W90, Phenoben W90, and Phenonip, by Georges Walther AG, or a mixture of phenoxyethanol, with one or more of methyl-, ethyl-, propyl-, and butylparaben. Other cosmetic preservatives such as iodopropinyl butylcarbamate, PEG-4 laurate, PEG-4 dilaurate can also be used. The concentration of the preservative is suitably from about 0.1% to about 0.1% wt. based on the formulation. Imidazolidinyl urea, suitably at a concentration of from about 0.1% to about 0.7% wt. based on the total formulation is also an essential ingredient

along with the preservative.

When using the premix made in accordance with the present invention, for the formulating of a cosmetic product, citric acid, and from about 0.05% to about 0.5% ethylenediamine tetraacetic acid (EDTA), or a salt thereof, such as the sodium salt, are added to the premix before or with the other conventional cosmetic ingredients. It has been found that for optimally long shelf life the presence of the 4 components is needed, namely the preservative and the imidazolidinyl urea component in the premix, and the citric acid and EDTA or salt thereof in the end product.

The proportions of the essential ingredients of the premix and the two ingredients subsequently added during formulation, can vary according to the desired characteristics of the cosmetic end product, and can be determined for each particular kind of product by routine experimentation. Suitably the cosmetic end product contains from about 3% wt. to about 13% wt. whey powder (or from about 20% wt. to about 45% wt. whey powder based on the premix).

For example, a suitable aqueous body shampoo formulation contains,

among other ingredients, about 6% wt. whey powder, about 0.8% Phenova W90, about 0.15% wt. citric acid, about 0.12% wt. tetrasodium EDTA, and a cosmetic additive. A suitable day cream cosmetic formulation can contain about 9% wt. whey powder, and about 0.3% wt. each of Phenova W90 and imidazolidinyl urea, with about 0.1% wt. each of citric acid and EDTA added to the premix in preparing the product. A suitable liquid soap composition is made with about 6% wt. based on the products of whey powder, about 0.8% wt. Phenova W90, about 0.3% wt., imidazolidinyl urea, about 0.12% wt. EDTA, and about 0.020% wt. citric acid (with from about 0.08 to about 0.5% wt. each of the paraben composition and the imidazolidinyl urea, independently of each other, based on the premix). Optionally, some cosmetically beneficial additives, such as for example aloe barbadensis gel and jojoba oil can be added at the time when the finished cosmetic product is formulated. The finishing formulation of the cosmetic product itself is a conventional step *per se* which is familiar to skilled cosmetic formulators, and includes, according to the nature of the intended finished product, one or more of water, surfactant, fat, emulsifier, scouring compound, solvent, perfume and the like ingredients.

As used herein, “cosmetic additive” means one or more conventional

components of cosmetic products, such as surfactants, cream bases, emollients and the likes, all of which are within the ken of skilled cosmetic formulators.

In a similar manner a bath powder can be made from about 60 to about 85% wt. of a powdered whey, sodium bicarbonate, silica, perfume, and a stabilizer. In the only case of a bath powder no premix needs to be formed, since the formulated cosmetic product is not a liquid and does not contain a cream or other emollient.